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SIX WEEKS' BOTANIZING IN VERMONT,—I.

NOTES ON THE PLANTS OF THE BURLINGTON REGION.

SIDNEY F. BLAKE.

DURING the summer of 1911, acting on the suggestion of Prof. M. L. Fernald, I spent the period from 18 July to 30 August botanizing in the Champlain Valley of Vermont, devoting particular attention to tracing out the altitudinal ranges of a considerable number of plants whose distribution is in a general way coincident with the coastal plain or its extensions. Four weeks were spent in the Burlington Region, with Essex Junction as a center, after which I spent two weeks in northern Vermont, with headquarters at Swanton, the second town below the Canadian line on the shore of Lake Champlain.

Essex Junction, with an elevation of 358 feet above sea level, is in the midst of a number of sand and gravel plains of glacial origin, sometimes of very pure and shifting sand, on which are found several species very local or quite absent in other sections of the state, such as *Carex Muhlenbergii*, *Cyperus Houghtonii*, *Asclepias amplexicaulis*, and *Prunus cuneata*, with such commoner things of similar habitat as *Salix humilis*, *Lespedeza capitata*, *Lupinus perennis*, *Polygala polygama*, and *Viola adunca*. The highest sand plain met with, called locally the "High Plains," was at 500 feet, and here grew such plants as *Lechea intermedia*, *Aster linariifolius*, *Betula populifolia*, and *Myrica asplenifolia*, characteristic species of sterile soils nearly throughout New England. On the sandy beach of Lake Champlain (96 feet above sea level), at Malletts Bay and elsewhere, grew *Spartina Michauxiana*, *Scirpus americanus*, *S. fluviatilis*, *S. heterochaetus*, *Salix longifolia*, *Polanisia graveolens*, *Potentilla Anserina* and its handsome variety

sericea, *Hudsonia tomentosa* var. *intermedia*, *Artemisia caudata*, and many other plants more or less characteristic of the Lake shore, while among the species nearly or quite confined to the Winooski River were *Tussilago Farfara*, *Xanthium canadense*, *Equisetum variegatum* var. *Jesupi*, *Hypericum Ascyron*, and *Senecio Balsamitae*.

I wish to thank Dr. B. L. Robinson, Pres. Ezra Brainerd, Mr. F. T. Hubbard, and Prof. K. M. Wiegand for the identification of various species; Mrs. Nellie F. Flynn of Burlington, who guided me to several localities of interest in the Burlington Region, and has since furnished information about the occurrence of several species; and particularly Prof. M. L. Fernald, at whose suggestion the trip was made, who has verified practically all the identifications in the following list, and otherwise aided by advice on critical points.

In the following list, including all the species collected in the Burlington Region which seem worthy of record, those not in Mrs. Flynn's excellent Flora¹ are marked with an asterisk. Altitudes (taken by aneroid) are given in feet.

ASPIDIUM BOOTHII Tuckerm. Along brook in woods, Essex Junction.

A. CRISTATUM (L.) Sw. var. CLINTONIANUM D. C. Eaton. Damp soil in woods, Essex Junction; woods, alt. 565, Williston.

A. GOLDIANUM Hook. Woods, alt. 585, Williston, 31 July.

ASPLENIUM ACROSTICHOIDES Sw. Woods, alt. 460, Williston.

*PELLAEA ATROPURPUREA (L.) Link var. BUSHII Mackenzie. On rocks, alt. 220, Burlington, 27 July (*Blake* 2276). There are specimens in Gray Herbarium from Burlington (herb. D. C. Eaton) and from High Bridge, Aug. 1877, *C. E. Faxon*.

PHEGopteris HEXANGONOPTERA (Mx.) Fée. Woods, alt. 585, Williston.

FORMS OF OSMUNDA CINNAMOMEA L.

The forms of the Cinnamon Fern that are fairly recognizable are about seven in number, of which five occur in Vermont. They may be separated by the following key.

A. Fertile and sterile fronds quite distinct.

B. Pinnules entire.

C. Pinnules not glandular-pubescent.

¹ Nellie F. Flynn, *Flora of Burlington and Vicinity* (Contr. Bot. Vt. ix), 1911. The Burlington Region, to which the present notes are confined, includes Burlington, South Burlington, Colchester, Essex, Williston, and Shelburne.

1. *O. CINNAMOMEA* L. Sp. ii. 1066 (1753). Pinnules rounded or acutish, somewhat crowded to subremote.—Newfoundland to Florida, west to Illinois and Louisiana.—Including *O. cinnamomea* f. *angusta* Clute, Fern Bull. xvii. 12 (1909), which as represented in herb. Boston Society of Natural History by an authentic frond collected in a cedar swamp, Leicester, Vt., 17 July 1909, by D. L. Dutton, appears to be a not uncommon state in which the pinnules are somewhat revolute and a little remote, and has the appearance of a teratological development rather than a nameworthy variation.

CC. Pinnules and upper part of rachis glandular-pubescent.

2. *O. CINNAMOMEA* var. *GLANDULOSA* Waters, Fern Bull. x. 21 (1902). *O. cinnamomea* f. *glandulosa* Waters, l. c.—In swampy woods, Rhode Island, New Jersey, Maryland.

BB. Some of the pinnules crenulate, serrate, or lobed.

D. Pinnules not bearing ascidia.

E. Pinnules serrate, the teeth sharp; middle pinnules of the pinnae usually most deeply cut.

3. *O. CINNAMOMEA* f. *INCISA* (Huntington) Gilbert, N. A. Pterid. 13, 28 (1901); Clute, Fern Bull. xv. 16, with fig. (1907). *O. cinnamomea incisa* Huntington, Fern Bull. vii. 12 (1899).—Seen from New Hampshire, New York, Massachusetts, Minnesota, and VERMONT: damp woods, Swanton, 25 Aug. 1911, *Blake* 3159; Mt. Mansfield, Underhill, alt. 3670, 11 Aug. 1911, *Blake* 2733; common in rather exposed places, Jay Peak, 17 July 1908, *Winslow*; in sphagnum bog, alt. 1000, near Rutland, 1 July, 1908, *Kirk* (see *RHODORA* xi. 28 (1909)).—Including *O. cinnamomea* var. *auriculata* Hopkins, Am. Fern Journ. i. 100, fig. (1911), a development with enlarged basal pinnules as in the next, but with "pinnules of entire frond more or less dentate-serrate" (no specimens seen).

EE. Pinnules lobed, with rounded divisions; lobing most conspicuous toward base of frond, pinnae, and pinnules, the lowest pinnules often elongated.

*4. *O. CINNAMOMEA* f. *BIPINNATIFIDA* Clute, Fern Bull. xv. 17 (1907). *O. cinnamomea bipinnatifida* Clute, Fern Bull. xiv. 45 (1906).—Seen from all the New England states except Rhode Island, and from Florida (*Nash* 274); the following from VERMONT: pasture, alt. 620, Williston, 31 July 1911, *Blake* 2404.—Includes f. *trifolia* Clute, Fern Bull. xvii. 12 (1909).

EEE. Pinnules thin, deltoid to deltoid-oblong, with crenulate margin, the lower ones often faintly lobed.

*5. *O. CINNAMOMEA* f. *latipinnula* n. forma, pinnis alternis plerumque lato-oblongis, pinnulis paucis (ca. 10-jugis) alternis oblongo-deltoidis crenulatis, 1.5–2 cm. longis, 1 cm. latis.—Specimens examined: VERMONT: edge of woods, Swanton, 20 Aug. 1911, *Blake* 2981; MASSACHUSETTS: Great Swamp, Walpole, 7 Sept. 1906, *Churchill*; dry woods, Canton, 7 Oct. 1908, *Blake* (TYPE no. 239 in my herbarium).

DD. Midrib of pinnae naked for some distance below tip; many of the pinnules bearing ascidia on naked veinlets arising from the under surface; some of the pinnules lobed.

6. *O. CINNAMOMEA* f. *CORNUCOPIAFOLIA* Clute, Fern Bull. xvi. 108, 109, with plate (1908).—A curious form, not seen; described by Clute from a frond collected by A. S. Bossart in 1907 at Burton, Geauga Co., Ohio.

AA. Fertile frond partly foliaceous.

7. *O. CINNAMOMEA* f. *FRONDOSA* (T. & G.) Britton, Cat. Pl. N. J. 312 (1890). *O. cinnamomea* var. *frondosa* T. & G. in Torr. Cat. Pl. N. Y., in Ann. Rep. Geol. Surv. iv. 196 (1840).—Fertile frond with fruiting pinnae at base, apex, or middle, very variable; the sterile pinnae of fertile frond often lobed, and sometimes bearing a few sporangia at tips of veinlets.—Seen from all the New England states except Rhode Island, and from Pennsylvania.

BOTRYCHIUM TERNATUM (Thunb.) Sw. var. *INTERMEDIUM* D. C. Eaton. Leaf mold, base of Brownell Mt., Williston.

OPHIOGLOSSUM VULGATUM L. Pasture, Essex Junction.

**EQUISETUM HYEMALE* L. var. *AFFINE* (Engelm.) A. A. Eaton f. *POLYSTACHYUM* Prager. Sandy soil, Burlington, 22 July (*Blake* 2087). A form bearing sessile spikes from the upper nodes. For description see Eaton, Fern Bull. xi. 112 (1903).

E. PALUSTRE L. Damp spot beside road, alt. 120, Colchester, 22 July (*Blake* 2102); sandy shore of Malletts Bay, Colchester, 9 August (2627).

**E. VARIEGATUM* Schleich. var. *JESUPI* A. A. Eaton. Mrs. Flynn lists only the type, from Burlington and Colchester; but all my plants are of this variety, which is probably the common one in the Burlington Region. Shore of L. Champlain, Burlington (Mrs. Flynn's station); shore of Winooski River, where rather abundant, Essex Junction, 25 July (*Blake* 2186 in part); shore of Shelburne Bay, South Burlington, 13 August.

E. VARIEGATUM* var. *JESUPI* f. *geminatum***, n. forma, caulibus fertilibus 1-2 spicas sessiles vel brevipedunculatas nodis summis gerentibus. Fertile stems with one or two supernumerary spikes, sessile or on one-jointed peduncles from the topmost nodes. Specimens examined: VERMONT: shore of Winooski River, alt. 270, Essex Junction, 25 July, *Blake* 2186 part; and at 200 ft., 29 July, *Blake* 2345 part (TYPE SHEET no. 3461 in my herbarium).

E. VARIEGATUM* var. *JESUPI* f. *multirameum***, n. forma, caulibus fertilibus 1-7 multinodiatis ramos steriles vel spiciferos superioribus

nodis gerentibus. Fertile stems bearing from the upper nodes 1 to 7 long many-jointed often spiciferous branches. Specimens examined: MAINE: seepy gravelly shore, Fort Kent, 8 July 1904, *Fernald*; VERMONT: shore of Winooski River, Essex Junction, *Blake* 2186 part, and 2345 part (TYPE SHEET no. 3460 in my herb.); MICHIGAN: Keweenaw Peninsula, 1863, *Robbins*.

LYCOPodium ANNOTINUM L. Woods, alt. 485, Essex; woods, alt. 685, Williston, 7 August.

*L. CLAVATUM L. var. MEGASTACHYON Fernald & Bissell. Edge of wooded bank, Essex, 3 August. A single plant found, this bearing but a single fruiting branch.

L. OBSCURUM L. Quoted by Mrs. Flynn only from Burlington, but doubtless not uncommon. In woods, Burlington; damp woods, Williston, 31 July, and woods, Williston, alt. 685, 7 August; edge of wooded bank, Essex. A form intermediate between the type and the variety was collected in woods at Essex Junction on 26 July.

L. TRISTACHYUM Pursh. Dry woods, Burlington, 22 July and 2 August.

PICEA RUBRA (Du Roi) Dietr. Pasture, alt. 545, Williston.

TYPHA ANGUSTIFOLIA L. Swampy spot (near Central Vermont Railroad), Burlington (a different station from Mrs. Flynn's Burlington one).

SPARGANIUM AMERICANUM Nutt. Close to pond, Essex, alt. 270; boggy meadow, Essex Junction; edge of pond, alt. 300, Essex (*Blake* 2388). The last includes both the type and the variety **androcladum*, the two former representing the variety only; but the so-called var. *androcladum* is scarcely worthy of any recognition in nomenclature, simple and branched forms being almost always found growing together, so that the distinction based on presence or absence of branches is of no real value.

S. DIVERSIFOLIUM Graebn. Recorded only from Colchester by Mrs. Flynn. It seems to be not rare. Shore of Winooski River, alt. 270, Essex Junction (with the variety); bog, alt. 100, Colchester; mud flats of Hinesburg Pond, Williston, alt. 684 (*Blake* 2570). Number 2571, collected with the last, approaches *S. americanum*. With these grew also the variety (2569).

*S. DIVERSIFOLIUM var. ACAULE (Beeby) Fernald & Eames. Shore of Winooski River, Essex Junction (2206 part); mud flats of Hinesburg Pond, Williston, 7 August.

*S. LUCIDUM Fernald & Eames. Shore of Winooski River, near its

mouth, alt. 97, Burlington, 2 August (*Blake* 2428). A most unexpected occurrence of a plant of coastal plain range, hitherto known sparingly from Massachusetts to Illinois and Missouri.

**POTAMOGETON BUPLEUROIDES* Fernald. Shore of Winooski River, alt. 270, Essex Junction, 25 July (*Blake* 2212). Also a plant of coastal plain range, though less pronouncedly so, and likewise new to the state.

**P. EPIHYDRUS* Raf. var. *CAYUGENSIS* (Wiegand) Bennett. Shallow water in Winooski River, alt. 96, Burlington, 2 August (*Blake* 2425). New to the state.

P. HETEROPHYLLUS Schreb. Along the Winooski, Essex Junction, 21 and 25 July; shallow water, in Hinesburg Pond, Williston; Malletts Bay.

P. PUSILLUS L. Shore of Winooski, alt. 270, Essex Junction; shore of L. Champlain, Burlington.

P. RICHARDSONII (Benn.) Rydb. Mouth of Winooski, Burlington.

P. ROBBINSII Oakes. Malletts Bay, Colchester, 9 August.

SCHEUCHZERIA PALUSTRIS L. In sphagnum bog, Porters Swamp, Colchester. In herb. Boston Society of Natural History are a number of specimens collected in Colchester by William Oakes.

**SAGITTARIA ARIFOLIA* Nutt. This species, not in Mrs. Flynn's list, proved to be rather common. It was first found on 22 July by Mrs. Flynn and myself, while collecting along the shore of Lake Champlain in Burlington, and later I met with it as follows: shore of Winooski, Essex Junction (a single small plant); flats of L. Champlain, Colchester, 2 August, first near the mouth of the Winooski, then between Mills Point and Porter Point along the muddy shore of the Lake; sandy shore of Malletts Bay; shore of Potash Creek, close to mouth, South Burlington.

FORMS OF *SAGITTARIA HETEROPHYLLA* Pursh.

The formal varieties of this species mentioned in Gray's Manual, being mere leaf forms without stable characters or particular range, are properly treated as formae. Doubtless all of them occur in Vermont.

1. *SAGITTARIA HETEROPHYLLA* Pursh, Fl. Am. Sept. ii. 396 (1814). Leaves on the same plant varying from linear-lanceolate and entire

to lanceolate or oval-oblong with two narrow acute hastate or sagittate basal lobes, the presence of the latter distinguishing it from all other forms except *elliptica*.—Seen only from Ontario, Massachusetts, New York, Delaware, Illinois, Missouri, and VERMONT: Burlington, July–August 1911, *Blake* 1860, 2430; mud flats of Hinesburg Pond, alt. 684, Hinesburg, *Blake* 2595; Little Otter Creek, Ferrisburg, 10 Aug. 1880, *C. E. Faxon*.

2. *S. HETEROPHYLLA* f. **elliptica** (Engelm.) n. comb. *S. heterophylla* var. *elliptica* Engelm. in Gray, Man. ed. 2. 439 (1856).—Leaves broadly elliptical, some of them with very acute arcuate-sagittate basal lobes, 8–10.5 cm. long, 5–9 cm. wide.—Specimens examined: MASSACHUSETTS: Lowell, 9 Aug. 1882, *Manning*; MISSOURI: St. Louis, Sept. 1846, *Engelmann*.

*3. *S. HETEROPHYLLA* f. **rigida** (Pursh) n. comb. *S. rigida* Pursh l. c. 397 (1814). *S. heterophylla* var. *rigida* Engelm. l. c. (1856). (?) *S. heterophylla* var. *angustifolia* Engelm. l. c. (?) *S. rigida* var. *Engelmanni* Farwell, Ann. Rep. Comm. Parks Detroit, xi. 44 (1900).—Leaves entire, lance-linear to oval, acute to acuminate at both ends, or rounded at base in the broadest-leaved specimens.—The commonest form, represented in the material examined from Quebec and Maine to Delaware, west to Minnesota, with the following from VERMONT: L. Champlain, Alburg, 1878, *Pringle*; shore of Shelburne Pond, Shelburne, *Blake* 2377; Malletts Bay, Colchester, *Blake* 2649; Ferrisburg, 1879, *Brainerd*.

*4. *S. HETEROPHYLLA* f. **fluitans** (Engelm.) n. comb. *S. heterophylla* var. *fluitans* Engelm. l. c. (1856).—Leaves all linear, or phyllodial and bladeless.—Specimens examined: VERMONT: Graveyard Point, North Hero, 2 Aug. 1899, *Brainerd*; L. Champlain, Aug. 1880, *C. E. Faxon*; shore of Maquam Bay, Swanton, 28 Aug. 1911, *Blake* 3191; Winooski R., Burlington, 2 Aug. 1911, *Blake* 2427; MASSACHUSETTS: Sheffield and Stockbridge, Aug. 1902, *Hoffmann*.

**S. LATIFOLIA* Willd. f. *GRACILIS* (Pursh) Rob. Along the Winooski, Essex Junction; shore of L. Champlain, Burlington.

CENCHRUS CAROLINIANUS Walt. Dry soil along railroad near Essex Junction station; in sand beside road, Essex.

DANTHONIA COMPRESSA Aust. Wooded hillside, Essex Junction. This and the next determined by Mr. F. T. Hubbard.

**ELYMUS AUSTRALIS* Scribn. & Ball. Edge of woods along Winooski River, alt. 235, Essex Junction, 21 July (*Blake* 2043). Previously collected in the state at Jamaica by L. A. Wheeler (see *RHODORA*, March 1912).

**ERAGROSTIS PECTINACEA* (Mx.) Steud. Sand bank, along railroad alt. 340, Essex Junction, 25 July (*Blake* 2176). An interesting oc-

currence, the plant being of coastal plain affinities, and previously known in Vermont only from the lower Connecticut Valley.

**MUHLENBERGIA FOLIOSA* (R. & S.) Trin. Damp spot in railroad embankment, alt. 345, Essex Junction, 20 July (*Blake* 1889). Determined by Mr. Hubbard, as were the following Panicums. Previously recorded from Townshend, *L. A. Wheeler*, by Kirk in RHODORA, March 1912. The following specimens in the Gray Herbarium, determined by Mr. Weatherby, all originally ticketed *M. mexicana*, show that the species is at least well distributed in the state: damp places, Sudbury, 14 Sept. 1896, *F. W. Hubby*; base of Willoughby Cliff, 4 Aug. 1881, and Fourth of July and North Slides, Willoughby Mt., 19 Aug. 1896, *Faxon*; North Pownal, 19 Aug. 1903, *Blanchard*. *M. foliosa* subsp. *ambigua* (Torr.) Scribn. is also represented in the Gray Herbarium by a sheet from Lake Champlain, 14 Sept. 1881, *Faxon*.

PANICUM DICHOTOMUM L. Wooded hillside, Essex Junction.

P. TENNESSEENSE Ashe. Winooski Gorge, Colchester.

**CAREX FLAVA* L. var. *RECTIROSTRA* Gaudin. Mud flats of Hinesburg Pond, alt. 684, Williston, 7 August.

**C. LANUGINOSA* Mx. Shore of Winooski R., alt. 270, Essex Junction, 25 July.

**C. OLIGOSPERMA* Mx. Porters Swamp, Colchester, 2 August.

**C. PSEUDO-CYPERUS* L. Damp soil, Shelburne Pond, Shelburne, 30 July (*Blake* 2371).

**C. ROSEA* Schkuhr var. *RADIATA* Dewey. Woods, alt. 765, Williston, 5 August (*Blake* 2540).

**CYPERUS DIANDRUS* Torr. Sandy shore of Malletts Bay, Colchester, 9 August (*Blake* 2623). Apparently only the third record for the state.

C. HOUGHTONII Torr. The previous records for the state are as follows: Fairlee Lake, *Jesup*¹; Colchester, Oct. 1901, *Mrs. Flynn*²; Castleton, 1911, *Brainerd*³. My experience seemed to show that the plant is not very uncommon in the Burlington Region, always growing in dry sand,⁴ although this is not in all cases shifting as at Mrs. Flynn's Colchester locality. I made the following collections of the species; in Essex: sand along railroad, alt. 350, 26 July (2248, 2249); 2248 was

¹ Fl. Vt. 22 (1900).

² RHODORA v. 191 (1903).

³ RHODORA xiv. 40 (1912).

⁴ Except on one occasion, when it was found growing in the gravel between R. R. ties.

collected from a small clump about three-quarters of a mile north of the Essex Junction station, 2249 from another larger colony about three-quarters of a mile further north, which also extended up the side of a nearby hill to 440 ft. altitude, above which height the hill was wooded; sandy wood road, alt. 500, 3 August, on the "High Plains"; pure sand, alt. 410, 3 August. In Essex Junction: pure sand, alt. 360, 26 July (thirty plants or more, a little north of the station, growing with *C. filiculmis* var. *macilentus*); gravel between railroad ties, 3 August; sand plain, alt. 360, 14 August. In Colchester: sand plain, back of Fort Ethan Allen, alt. 350, 23 July; in sand, alt. 340, 9 August (this was Mrs. Flynn's original station).

The fruiting season, given as "Aug., Sept." in Mrs. Flynn's list, should be extended to include July as well, as many of my plants collected on 23 July are in good fruit.

**C. STRIGOSUS* L. var. *COMPOSITUS* Britton. Along brook, alt. 310, Essex Junction, 20 July (*Blake* 1969); shore of Winooski River, alt. 97, Burlington, 2 August (2429). New to the state.

ELEOCHARIS INTERMEDIA (Muhl.) Schultes. Sandy shore of Malletts Bay, Colchester, 9 August.

**E. PALUSTRIS* (L.) R. & S. var. *CALVA* (Torr.) Gray. Shore of Lake Champlain, Burlington, 22 July (*Blake* 2076).

E. PALUSTRIS (L.) R. & S. var. *MAJOR* Sonder (var. *vigens* Bailey). Shore of Malletts Bay, 22 July and 9 August; flats of Lake Champlain, Colchester.

SCIRPUS ATROCINCTUS Fernald f. **brachypodus** (Fernald) n. comb. *S. atrocinctus* var. *brachypodus* Fernald, Proc. Am. Acad. xxxiv. 503 (1899).—Pasture, alt. 370, Williston, 30 July (a small colony with none of the type form near).—Occurring practically throughout the range of the type, often growing with it, and intimately connected by numerous intermediate specimens.

S. ATROVIRENS* Muhl. f. **sychnocephalus (Cowles) n. comb. *S. sylvaticus* (var. *atrovirens*) var. *sychnocephala* S. N. Cowles, Am. Nat. iii. 101 (1869). *S. atrocirens* var. *pycnocephalus* Fernald, RHODORA viii. 163 (1906).—Shore of Winooski River, alt. 270, Essex Junction, 25 July (*Blake* 2203): three plants collected, two good *sychnocephalus*, the other intermediate. Rocky shore of Winooski near High Bridge, Essex Junction, 28 July; meadow along Winooski River, alt. 98, Burlington, 27 July. New to the state.—Cowles' var. *sychnocephala*, from North East, Pennsylvania, is evidently the same as var. *pycnocephalus* Fernald, of much later date.

**S. CYPERINUS* (L.) Kunth var. *PELIUS* Fernald. Along brook, Essex Junction (*Blake* 1966); Porters Swamp, Colchester (2443); meadow, alt. 684, Williston (2581); Malletts Bay (2635).

S. CYPERINUS* (L.) Kunth var. *PELIUS* Fernald f. *condensatus*** (Fernald) n. comb. *S. cyperinus* var. *condensatus* Fern. RHODORA ii. 16 (1900). *S. Eriophorum* var. *condensatus* Fern. Proc. Am. Acad. xxxiv. 501 (1899).—Meadow at south end of Shelburne Pond, 30 July (*Blake* 2379, 2380); meadow, Shelburne (2383); pasture, alt. 370 (2390), and pasture, alt. 620 (2403), Williston, 31 July; grassy soil, alt. 780 (2559), and pasture, alt. 725 (2560), Williston, 7 August.

**S. OCCIDENTALIS* (Wats.) Chase. Shore of Malletts Bay, Colchester, 22 July (*Blake* 2099), and 9 August (2633, 2634); shore of Shelburne Pond, alt. 330, Shelburne (2373); meadow at south end of Shelburne Pond (2378); damp soil, near shore of Lake Champlain, Colchester, 2 August.

S. SMITHII Gray. Shore of L. Champlain, Burlington.

**S. TORREYI* Olney. Shore of L. Champlain, Burlington, 27 July (*Blake* 2297). Also collected perhaps two hundred yards above this spot, along shore of Winooski River, in Burlington, on 2 August. About the fifth record for the state.

ERIOCAULON SEPTANGULARE With. Shore of Malletts Bay, Colchester (Mrs. Flynn's locality); sandy shore of Hinesburg Pond, alt. 684, Williston.

JUNCUS ARTICULATUS L. Shore of Winooski R., alt. 270, Essex Junction; rocky shore of Winooski near High Bridge, Essex Junction, alt. 215; shore of L. Champlain, Burlington.

(*J. brachycephalus* (Engelm.) Buchenau. The record of this species in Bull. 7 Vt. Bot. Club, p. 16, based on my report of the plant to Mrs. Flynn, should be expunged, the specimens being immature *J. brevicaudatus* (Engelm.) Fernald.)

**J. EFFUSUS* L. var. *PYLAEI* (Laharpe) Fernald & Wiegand. Damp spot in railroad embankment, alt. 345, Essex Junction, 20 July (*Blake* 1887).

**J. EFFUSUS* L. var. *SOLUTUS* Fernald & Wiegand. Near pond, alt. 270, Essex (*Blake* 2128); along Winooski River, Burlington (2434), New to the state.

**J. FILIFORMIS* L. Shore of Malletts Bay, L. Champlain, Colchester, 9 August (*Blake* 2638). I find also a fragment including the inflorescence entangled in a mounted specimen of *Scirpus pedicellatus* which I collected at the same locality on 22 July.

J. PELOCARPUS Mey. Shore of Malletts Bay; flats of Lake, Colchester, near mouth of Winooski; shore of Lake, Burlington.

CALOPOGON PULCHELLUS (Sw.) R. Br. Porters Swamp, alt. 100. Colchester.

HABENARIA BRACTEATA (Willd.) R. Br. Woods, alt. 765, Williston.

H. CLAVELLATA (Mx.) Spreng. Damp spot in railroad embankment, alt. 345, Essex Junction (a single plant).

POPULUS BALSAMIFERA L. Sandy hillside, alt. 430, Essex, 26 July — an odd habitat for this species of swamps and river borders.

*SALIX ALBA L. Dampish soil, Burlington, 19 July (Blake 1832), in woods near the railroad yards. New to the state.

S. DISCOLOR Muhl. var. ERIOCEPHALA (Mx.) Anders. Shore of Shelburne Bay, Queen City Park, South Burlington.

*S. LUCIDA Muhl. var. ANGUSTIFOLIA Anders. Shore of L. Champlain, Burlington, 22 July (Blake 2069). New to the state.

S. NIGRA Marsh. Material referable to var. *falcata* (Pursh) Torr., as at present understood, was collected at Burlington and Williston; but from many observations in Vermont and Massachusetts I have become convinced that this so-called variety represents merely the normal condition of young branchlets in this species. The leaves on older wood and at base of first year shoots are oblong and straight, those at tips of young shoots much narrower and scythe-shaped.

S. PEDICELLARIS Pursh var. HYPOGLAUCA Fernald. South end of Porters Swamp, Colchester. Mrs. Flynn, following the Manual strictly, gives *S. pedicellaris* only, but the only form known¹ in the Burlington Region is var. *hypoglauc*a Fernald.

CARYA ALBA (L.) K. Koch. Pasture, alt. 570, Williston, 31 July; woods, alt. 695, Williston, 5 August.

(PARIETARIA PENNSYLVANICA Muhl. There is a specimen in herb. N. E. B. C. collected in Shelburne by William Boott on 2 Oct. 1855.)

COMANDRA UMBELLATA (L.) Nutt. Railroad embankment, Essex Junction, 20 July; wooded hillside, Essex Junction, 21 July.

*POLYGONUM AMPHIBIUM L. Sp. i. 361 (1753). (?) *P. amphibium* var. *longispicatum* Peck, N. Y. State Mus. Rep. xlv. 129 [repr. 49] (1893).—Shore of Winooski R., near mouth, Burlington, 27 July; shallow water in Winooski R., Colchester, 2 August; mud flats and sandy shore of Hinesburg Pond, alt. 684, Williston (Blake 2567, 2578 part: passing to f. *Hartwrightii*).

¹ See Fernald, RHODORA xi. 157-162 (1909).

P. AMPHIBIUM L. f. **Hartwrightii** (Gray) n. comb. *P. Hartwrightii* Gray, Proc. Am. Acad. viii. 294 (1870). *P. amphibium* var. *Hartwrightii* Bissell, RHODORA iv. 105 (1902).—Occurring as an emersed development on the same rootstock as the typical form, also sometimes isolated in dry woodlands and peat bogs. Bissell's paper should be consulted for evidence of the ecological nature of the form.—Rather open spot in woods, Burlington; swampy spot, Colchester (Blake 2455); sandy shore of Hinesburg Pond, alt. 684, Williston (2578 part); sandy shore of Malletts Bay (2651, 2652); shore of Potash Creek, South Burlington (passing to f. *terrestre*).

P. AMPHIBIUM* L. f. **terrestre (Leers) n. comb. *P. amphibium* var. *β. terrestris* Leers in Willd. Sp. Pl. ii. 443 (1799); not of Gray's Man. ed. 1-5, which is *P. Muhlenbergii* (Meisn.) Wats.—Merely an emersed form of the type, with acute leaves very similar to those of *P. Muhlenbergii* but smaller, and pubescent like that species, but without the glandularity of the peduncles characteristic of it.—Meadow, Colchester, 2 August (Blake 2465).

P. ERECTUM L. Queen City Park, in paths, South Burlington.

P. PENSYLVANICUM L. A form was collected at Essex Junction, and later at Swanton, with leaves bearing a red spot as in *P. Persicaria* L.

RUMEX MEXICANUS Meisn. Waste land near L. Champlain, Burlington.

CHENOPODIUM GLAUCUM L. Lumber yard and railroad yard, Burlington.

SALSOLA KALI L. var. *TENUIFOLIA* G. F. W. Mey. Near Essex Junction railroad station.

**CERATOPHYLLUM DEMERSUM* L. Shallow water in Hinesburg Pond, alt. 684, Williston, 7 August.

CASTALIA TUBEROSA (Paine) Greene. Shallow water in Winooski River, Colchester.

RANUNCULUS ABORTIVUS L. var. *EUCYCLUS* Fernald. Rocks in woods, alt. 660, Williston.

R. DELPHINIFOLIUS Torr. f. **terrestris** (Gray) n. comb. *R. multifidus* var. *terrestris* Gray, Man. ed. 5. 41 (1867). *R. lacustris* var. *terrestris* MacMillan, Metasp. Minn. Valley, 247 (1892). *R. delphinifolius* var. *terrestris* Farwell, Ann. Rep. Comm. Parks Detroit xi. 63 (1900). *R. missouriensis* Greene, Erythaea iii. 20 (1895).—Merely a stranded development, often on the same stem with the typical aquatic form.—Colchester, 2 August (Blake 2451, 2461).

**ARABIS CANADENSIS* L. Woods, alt. 765, Williston, 5 August.

**BARBAREA VULGARIS* R. Br. Along brook, alt. 310, Essex Junction, 20 July.

BRASSICA NIGRA (L.) Koch. Waste land near L. Champlain, Burlington.

RADICULA PALUSTRIS (L.) Moench. Along the Winooski R., Essex Junction.

**SISYMBRIUM OFFICINALE* (L.) Scop. About fifty plants, near farmhouse, Burlington,—the station discovered by Mrs. Flynn on 24 July; three plants in pasture, Shelburne, 30 July; one plant near farmhouse, Colchester, 2 August. See Flynn, Bull. 7 Vt. Bot. Club, 17 (1912); Blake, *RHODORA* xiv. 190–192 (1912).

POLANISIA GRAVEOLENS Raf. A single plant collected along the railroad at Twin Bridges, alt. 250, Colchester, 24 July, about five miles above the mouth of the Winooski.

**AMELANCHIER CANADENSIS* L. (Not of Mrs. Flynn's list.) Beside road, alt. 160, Burlington, 27 July (*Blake* 2278); shady roadside, alt. 140, Burlington 2 August (2497). This and the two following identified by Prof. K. M. Wiegand.

?*A. HUMILIS* Wiegand. A doubtful collection, possibly of this species, made with the last (2496).

A. LAEVIS Wiegand. (*A. canadensis* L. of Mrs. Flynn's list.) Essex Junction (2037) and Colchester (2472).

CRATAEGUS MACRACANTHA Lodd. Edge of woods, Essex Junction.

C. PUNCTATA Jacq. Pasture, Williston, alt. 505.

**FRAGARIA GRANDIFLORA* Ehrh. Lumber yard, Burlington, 19 July.

POTENTILLA ANSERINA L. var. *SERICEA* Hayne. In addition to Mrs. Flynn's locality on the shore of L. Champlain in Burlington, the following stations were found for this variety: sandy soil, Colchester, between Barney Point and Colchester Point; rocky shore of Lake, between Mills Point and Porter Point, Colchester; shore of Malletts Bay; shore of Shelburne Bay, Queen City Park, South Burlington.

**P. MONSPELIENSIS* L. var. *NORVEGICA* (L.) Rydb. A single plant found in sand along railroad, Essex, 26 July.

**P. PALUSTRIS* (L.) Scop. f. *SUBSERICEA* (Becker) Wolf, Monog. *Potentilla* 76 (1908). *P. palustris* var. *subsericea* Becker, Deutsch. Bot. Monatsschr. xv. 85 (1897). — This handsome but inconstant form, first recorded from America by Fernald & Wiegand in *RHODORA*

for June 1910, twice came under my notice in the Burlington Region. It was collected in swampy soil at the south end of Porters Swamp, Colchester, 2 August (*Blake* 2442), and later the same day a less typical form of it was collected (2456), growing with *Polygonum amphibium* f. *Hartwrightii*, an analogous state of another amphibious species, in a swampy spot near Barney Point, Colchester. The latter number was clearly intermediate between the typical form and good *subsericea*, and the inconstancy of the character of pubescence, coupled with the presumptive evidence of its ecological nature afforded by the habitat — more or less exsiccated swampy ground or meadow in each case — shows that the plant is better considered a forma than a variety.

ROSA CINNAMOMEA L. Pasture about old house-site, Williston.

HYPERICUM ASCYRON L. Rocky shore of Winooski R. near High Bridge, Essex Junction, alt. 215. The only locality in the Region.

*H. BOREALE (Britton) Bicknell. Rather common. Collected twice at the same spot on the shore of Lake Champlain in Burlington, 27 July (*Blake* 2300) and 2 August; on sandy shore of Malletts Bay, Colchester, 9 August; flats of L. Champlain, and in meadow, Colchester, 2 August; mud flats of Hinesburg Pond, alt. 684, Williston.

H. CANADENSE L. Shore of Winooski R., alt. 270, Essex Junction (two small plants).

*H. MAJUS (Gray) Britton. Edge of woods, alt. 360, Essex Junction, 23 July (a single specimen); shore of Lake Champlain, Burlington; sandy shore of Malletts Bay; sandy shore of Hinesburg Pond, Williston.

VIOLA AFFINIS Le Conte. Edge of woods, Shelburne. Determined by Pres. Brainerd.

V. CUCULLATA? × FIMBRIATULA. A hybrid considered by Pres. Brainerd to be probably of this parentage was collected not very far from the last.

EPILOBIUM MOLLE Torr. Collected at Mrs. Flynn's Burlington station on 27 July, and also on two other occasions: meadow, Essex Junction, 29 July; near brook, alt. 430, Essex (a single plant).

OENOTHERA MURICATA L. A single specimen of this species, as understood in Gray's Manual, was collected in South Burlington near mouth of Potash Creek.

MYRIOPHYLLUM SPICATUM L. Shallow water, Malletts Bay, in fruit; Hinesburg Pond, Williston.

SANICULA TRIFOLIATA Bicknell. Woods, alt. 585, Williston, 31

July (2402). Mrs. Flynn's only record is of a specimen in the Gray Herbarium, collected by William Boott in Shelburne on 30 Sept. 1855.

**GAYLUSSACIA BACCATA* (Wang.) C. Koch f. *GLAUCOCARPA* (Rob.) Mackenzie. Near the Winooski River, Colchester, 24 July (2367); dry woods, Burlington.

RHODODENDRON CANADENSE (L.) BSP. Porters Swamp, Colchester, 2 August.

VACCINIUM CANADENSE Kalm. Dry hill, Essex, 3 August.

**V. PENSILVANICUM* Lam. var. *MYRTILLOIDES* (Mx.) Fernald. Damp hollows, alt. 340, Essex Junction, 20 July (Blake 1929). New to the state.

FRAXINUS PENNSYLVANICA Marsh. var. *LANCEOLATA* (Borkh.) Sargent. Waste land near L. Champlain, Burlington; damp soil, Colchester.

**APOCYNUM MEDIUM* Greene. Rocky shore of Winooski River near High Bridge, alt. 215, Essex Junction, 28 July (2320).

ASCLEPIAS SYRIACA L. The members of a colony growing in pure sand, without shade, in Colchester, were strongly glutinous on stems, peduncles, pedicels, and upper leaf surfaces, evidently as a result of the unusual environment.

CONVOLVULUS ARVENSIS L. Sawdust bank, Essex Junction, 28 July.

**GALEOPSIS TETRAHIT* L. var. *BIFIDA* (Boenn.) Lej. & Court. Essex Junction, 20 July; probably the only form occurring.

HEDEOMA HISPIDA Pursh. On a sand plain, alt. 495, Essex, 3 August, not far from the Essex Junction reservoir: native?

* \times *PETUNIA HYBRIDA* Hort. A single plant in sandy soil at Fort Ethan Allen, Essex, 23 July; like *P. nyctaginifolia* Juss., but with violet corolla.

GALIUM APARINE L. Damp soil, Essex, 23 July.

VIBURNUM DENTATUM L. Along stone wall, alt. 695, Williston near Hinesburg Pond, 7 August; also seen by roadside at 730 ft. alt., a short distance away.

**CAMPANULA ULIGINOSA* Rydb. Meadow at south end of Shelburne Pond, Shelburne, 30 July (Blake 2375); meadow, Colchester, 2 August.

**ANTENNARIA OCCIDENTALIS* Greene. Dry soil by roadside, alt. 125, Colchester, 22 July (2106).

A. PARLINII Fernald. Dry hill, Shelburne, 30 July.

(*Aster novi-belgii* L. Mrs. Flynn's record in Bull. 7 Vt. Bot. Club, 16, based on a doubtful report of mine, should be erased.)

**BIDENS VULGATA* Greene. Shore of Winooski River, alt. 240, Essex Junction, 25 July (2229).

**EUPATORIUM PERFOLIATUM* L. var. *TRUNCATUM* Gray. Sandy shore of Malletts Bay, Colchester, 9 August (2657).

**E. PURPUREUM* L. Edge of woods along Winooski River, alt. 235, Essex Junction, 21 July (*Blake* 2039). On the doubtful list of the state flora since 1900, now first definitely reported.

**E. PURPUREUM* L. var. *FOLIOSUM* Fernald. Along brook, Essex Junction, alt. 310, 20 July (1970). Also new to the state. This and the preceding identified by Dr. Robinson.

LACTUCA CANADENSIS L. var. *MONTANA* Britton. Beside road, Burlington (a single plant).

PRENANTHES TRIFOLIOLATA (Cass.) Fernald. Dry bank, Essex Junction.

TANACETUM VULGARE L. var. *CRISPUM* DC. Pasture (about old house-site), Williston; sandy shore of Malletts Bay, Colchester.

STOUGHTON, MASSACHUSETTS.

A PECULIAR VARIETY OF THE CANOE BIRCH.

M. L. FERNALD.

IN the genus *Betula* the 3-lobed bracts of the pistillate aments are so nearly universal as to be used as a generic character. In fact, so general is this character that the little shrub of the tundra of Newfoundland, southern Labrador and adjacent Canada, *B. nana* L., var. *Michauxii* (Spach) Regel, in which the bracts are commonly quite simple and oblong in outline, was made by Opiz a separate genus, *Apterocaryon*.¹ In habit, foliage, pubescence, nutlets, etc., this little shrub is, however, very similar to the polar *B. nana*, and, as already pointed out by the writer,² specimens occur which show a transition from the simple bract of the variety to the 3-lobed bract of the typical form of the species.

¹ Opiz, *Lotus*, v. 258 (1855).

² Fernald, *Am. Jour. Sci.*, ser. IV. xiv. 187 (1902).

In view of the peculiarity of the bracts of *Betula nana*, var. *Michauxii*, it was interesting to find in the ravine of one of the headwaters of the Ruisseau à la Neige on Mt. Albert, Gaspé County, Quebec, a colony of small trees and shrubs of *Betula alba* L. (*B. pubescens* Ehrh.) which showed a similar variation. In the Mt. Albert trees the bracts are mostly oblong and unlobed but an occasional bract is 3-lobed as in the typical form of the species. This tree of Mt. Albert may be designated

BETULA ALBA L., var. **elobata**, n. var., trunco humili vel mediocri usque 6 m. alto; foliis maturis 4.5–6 cm. longis rhomboideo-ovatis basi rotundatis vel subcuneatis supra glabris subtus ad nervos pilosis; strobilis pendulis 1.5–2 cm. longis 7–9 mm. crassis, pedunculis 0.7–1.3 cm. longis; squamis oblongis integris vel undulatis ciliatis. Small or medium-sized tree (up to 6 m. high): mature leaves 4.5–6 cm. long, rhombic-ovate, rounded or subcuneate at base, glabrous above, pilose on the nerves beneath: strobiles pendulous, 1.5–2 cm. long, 7–9 mm. thick, on peduncles 0.7–1.3 cm. long: bracts oblong, entire or undulate, ciliate.—QUEBEC: crevices and talus of serpentine along Ruisseau à la Neige, Mt. Albert, Gaspé County, July 25, 1906, *Fernald & Collins*, no. 531 (TYPE in Gray Herb.).

GRAY HERBARIUM.

THREE PLANTS WITH EXTENSION OF RANGE.

FRANK S. COLLINS.

PANICUM BICKNELLII Nash. At Brewster, Barnstable County, Massachusetts, Sept. 10, 1912. Distribution given in Gray's Manual as Ct. to N. C.

JUNCUS BUFONIUS var. *HALOPHILUS* Buchenau & Fernald. Shore of "Sunken Meadow," Barnstable County, Massachusetts, Sept., 1911. According to the Manual, Gulf of St. Lawrence to Mass.; but the southernmost locality hitherto reported is Plum Island, near Newburyport.

While these extensions are worth recording, I take no credit for the discoveries; for the past few years, whenever I have been on Cape

Cod, I have collected everything I came across, unless I was sure I had already collected it from the same locality. As regards grasses, sedges etc., my ignorance is so thorough that I have seldom refrained from collecting, and at the end of the season I have turned over the whole lot to the Gray Herbarium. In each case Prof. Fernald has been good enough to name the plants, and each season some have been found that were growing outside of their recorded range. It only shows that one need not be a specialist to contribute to our knowledge of the flora of the region. The wayfaring man, even in the extreme case mentioned in the scriptures, will not err if he collects freely, and sends his specimens to Prof. Fernald.

POTENTILLA TRIDENTATA Ait. Sandy plain, Eastham, May 30, 1913. This is on a different footing from the two species already mentioned, as it is an old acquaintance of mine, with many pleasant associations. I first saw it at Bath, Maine, in August, 1880, where I had to stop over Sunday at a hotel there, in consequence of a sudden and unannounced change of time by a local steamer; I feel sure that every reader who has travelled on the Maine coast will recall some similar experience of his own. Then when Mr. Dame and myself were compiling the Flora of Middlesex County, we found this species on the summit of Mount Watatic. The boundary line between Worcester and Middlesex counties crosses this summit, and Mr. Dame, Dr. C. W. Swan and myself went all over the open ground on our hands and knees, until we were sure that the plant, not then in bloom, was actually on the Middlesex side of the line. At the time the Flora was published, this station was the only one in the county, but the plant was afterwards found at Wilmington. Though I have seen it many times since, it always has a special interest for me, but nothing could have been more unexpected than its occurrence along a "road" (three deep ruts in the open field) near the Bay shore of Eastham, about half a mile northwest of North Eastham station. The colony extended for some rods along the road, and the plants were in full flower, with abundant seed capsules from last year. The range is given in the Manual as Lab. to e. N. E., where common in exposed rocky or gravelly situations, N. J., and southward on the upper Alleghenies; also westward, chiefly along the Great Lakes. The Wilmington station is probably the nearest to Eastham.

NORTH EASTHAM, MASSACHUSETTS.

ADVANCE OF POTAMOGETON CRISPUS L.—The 7th edition of Gray's Manual gives the range of this species as extending from Massachusetts to Ontario and Virginia. Here in the lagoons of Jackson Park, Chicago, Ill., it is very abundant. Much work is needed to keep it cleaned out in the spring, when its growth is most vigorous. These lagoons are connected with Lake Michigan, and it seems reasonable to suppose that this species has made its appearance here by way of the Great Lakes. In the lagoons of Washington Park, about a mile west, which have no connection with the lake, a careful search has failed to reveal it, and it probably does not occur. It is also found in abundance at Wolf Lake, Indiana. This body of water lies near Lake Michigan, and is connected with it.

It would be interesting to know just when the plant first made its appearance in this region. That it has occurred here for a few years at least is well known to most botanists hereabouts, but I believe that nothing concerning it in this vicinity has ever appeared in print. Guided by the index to American botanical literature published monthly in the Bulletin of the Torrey Botanical Club, I have looked up every reference from 1899 to the present date that might concern the flora of Illinois and Indiana, both systematic and ecological treatises, but I have found nothing regarding this plant. There may be a reference to it, however, in some note which the Bulletin has not seen fit to index. If so, I have overlooked it, but I do not believe that this is the case. If nothing has appeared then this may be regarded as an addition to the flora of both states. The advent of the plant, however, has doubtless been very recent, perhaps within the last ten years. In 1883 E. J. Hill¹ noted nine species of *Potamogeton* from Wolf Lake, but made no mention of *P. crispus*. In 1899 S. Coulter's 'Flora of Indiana' appeared, but this species was not included therein. Following the publication of Coulter's book, notably from 1900–1905, many additions to the Indiana flora came out in the 'Proceedings of the Indiana Academy of Science,' but this plant, if it occurred at all, seems to have escaped notice. My own acquaintance with it began in 1909. By this time it had become common.

The plant should, I think, now be found still further westward, especially along the Illinois and Mississippi Rivers, as it can reach the Illinois, which flows into the Mississippi, by way of the Drainage Canal.

¹ Bot. Gaz. 9:45–48. 1884.

When currents are favorable, a steady stream of branches can be seen flowing from the lagoons out into the lake.

A specimen has been sent to the Editor to verify its identity.—
EDWIN D. HULL, CHICAGO, ILL.

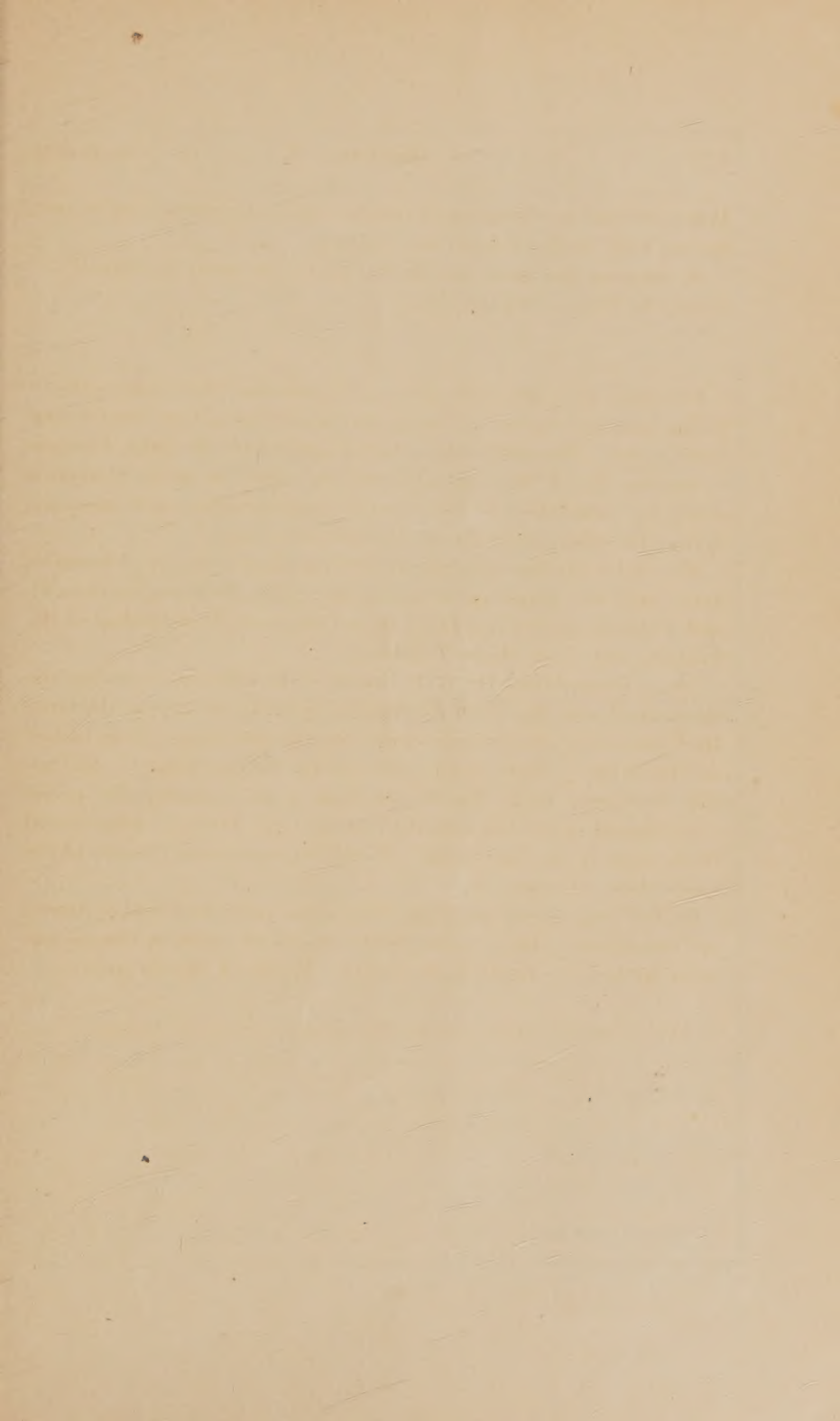
FURTHER WOOL-WASTE PLANTS AT WESTFORD, MASSACHUSETTS.—
It has been my custom to visit a wool-waste dump near here several times a year. Generally I have found some of the Medicks, *Erodium cicutarium* (L.) L'Hér. and (I regret to name the next) *Centaurea maculosa*, established in two pastures and spreading into mowings even to the other side of the road several rods away.

No wool-waste has been placed here for three years, yet I found in June, 1913, two plants quite new to our region, *Erodium ciconium* L. and *Trifolium purpureum* Lois., there being a single individual of the *Erodium* and seven of the *Trifolium*.

I have learned from Dr. B. L. Robinson the following regarding the specimens I sent him: "Of *Erodium ciconium* L. we have at the Gray Herbarium only one specimen from America and that is from ballast at Philadelphia, where it was collected by the late Isaac C. Martindale, in August, 1877. On the sole basis of this specimen the species is mentioned in the Synoptical Flora by Prof. Trelease, who revised the *Geraniaceae* for that work. We find no more recent record of the species from America.

Of *Trifolium purpureum* Lois. there seems to be no record of American occurrence. These species both come from southern Europe and adjacent Asia."—EMILY F. FLETCHER. Westford, Massachusetts.

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